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UNITED STATES.

Quarantine regulations for domestic ports to prevent the introduction of plague from Santos and Oporto.

[Circular No. 143.]

TREASURY DEPARTMENT,
OFFICE SURGEON-GENERAL, U. S. M. H. S.,
Washington, D. C., December 8, 1899.

*To United States consular officers, masters and owners of vessels,
national, State, and local quarantine officers, and others:*

In view of the officially reported prevalence of plague in Santos, Brazil, and Oporto, Portugal, and the local conditions at these ports, the following regulations, relating to vessels arriving therefrom at ports of the United States, are hereby promulgated. This circular will remain in force until thirty days after the official announcement of the cessation of plague in said cities. The regulations for domestic ports regarding plague, promulgated by Department circular of January 18, 1897, are embodied herein in full. Attention is called to the fact that all vessels from Santos and Oporto are to be subjected to the following requirements:

TREATMENT OF VESSELS FROM SANTOS AND OPORTO.

1. Place vessel in quarantine in anchorage sufficiently remote from the nearest land or other vessel to prevent the escape of rats by swimming.

2. Pilots bringing in vessels from these ports, if they go aboard the vessel, will be detained in quarantine a sufficient time to cover the

period of incubation of the disease, if in the opinion of the quarantine officer said pilots have been exposed to infection, and their dunnage, if any, disinfected.

3. In inspecting vessels from these ports, the personnel of the vessel shall be inspected after the removal of all clothing which will interfere with a thorough examination of all glandular regions, including axillary, inguinal, and cervical.

4. Remove all passengers from the vessel and all of the crew save those necessary to care for her. Place the sick, if any, in hospital and carefully isolate those specially suspected. Segregate the remainder in small groups. No communication shall be held between these groups. Those believed to be especially capable of conveying infection must not enter the barracks (place of detention) until they are bathed and furnished with sterile clothing; nor shall any material capable of conveying infection be taken into the barracks, especially food that may be contaminated.

5. All occupants of the steerage must be bathed and their clothing disinfected.

6. All baggage, including hand baggage, and effects accompanying steerage passengers and crew, must be disinfected.

7. No article from the vessel shall be admitted to the barracks before the disinfection of said article.

8. *Preliminary disinfection.*—After removal of the personnel as above, a preliminary disinfection of all accessible parts of the vessel must be performed with sulphur dioxide. This preliminary disinfection should be started in the morning in order that a water guard, in small boats, may be placed around the vessel to detect and destroy any escaping rats. (See Note.) No person with an abrasion or open sore shall be allowed to engage in handling vessel or cargo.

9. The water supply must be changed without delay, the casks or tanks disinfected by steam or 10 per cent solution of potassium permanganate, and, after thorough rinsing, refilled from a source of undoubted purity, or the water supplied must have been recently boiled.

10. Nothing shall be thrown overboard from the vessel, not even deck sweepings. Such material shall be burned in the furnace or in a place specially designated, but not in the galley.

DISINFECTION.

Disinfection of vessels from these ports shall be as follows:

DISINFECTION OF IRON VESSELS.

11. (a) *With cargo.*—After twelve hours' exposure to sulphur dioxide, 10 per cent per volume strength, generated by an approved furnace, or twenty-four hours' exposure to 5 per cent per volume strength, generated by pots, the upper 4 to 6 foot layer of cargo may be removed

and placed on lighters exposed to the sun; this process of disinfection and removal of successive layers to be continued until hold is empty.

12. Where it can be procured in sufficient quantity, liquefied sulphur dioxide may be used in the disinfection of cargoes, holds, and living apartments, it being borne in mind that it will be necessary to employ 2 pounds of this material in lieu of 1 pound of sulphur where indicated in the above regulations.

13. No person shall be allowed on the vessel or around the cargo with bare feet, and the use of gloves in handling the cargo or dead vermin is advised.

14. All merchandise placed on lighters, although covered with tarpaulins at night and during foul weather, should be freely exposed to the sun and air during the day and in good weather for one week.

15. (b) *Without cargo*.—After mechanical cleansing, the hold must be thoroughly washed with an acid solution of bichloride of mercury, 1 to 800, applied under pressure to all surfaces by means of a hose, followed by sulphur dioxide, 10 per cent per volume strength, for twenty-four hours, or 5 per cent per volume strength for forty-eight hours.

16. The water ballast of a vessel coming from these ports should be discharged at sea, or if discharged in fresh or brackish water must be previously disinfected, the tanks to be flushed and refilled with sea water or disinfected.

HOLDS OF WOODEN VESSELS.

17. For a wooden vessel the treatment is the same as for iron vessels, except that the exposure of the hold to sulphur dioxide, 10 per cent per volume strength, must precede the washing with bichloride in the empty vessel, and this exposure must be forty-eight hours in wooden vessels without cargo, or if only 5 per cent per volume strength sulphur dioxide is obtainable, the exposure must be seventy-two hours.

18. The disinfection and removal of cargo in layers shall be in the same manner as for iron vessels.

19. All solid ballast on vessels infected, or suspected of being infected, with plague to be discharged or disinfected previous to disinfection of hold; all such ballast discharged in fresh water to be disinfected by saturation with or immersion in an acid solution of bichloride of mercury, 1 to 800.

20. Clear, hard, close-grained rock may be permitted to remain on board, but only after disinfection by immersion in an acid solution, 1 to 800 of bichloride of mercury. Ballast removed from vessels infected, or suspected of being infected, with plague must not be taken from the quarantine station.

LIVING COMPARTMENTS OF ALL VESSELS.

21. These compartments—cabin, steerage, and forecastle—shall be treated by one of the following methods (a) or (b):

(a) Twelve hours' exposure to 10 per cent per volume strength sulphur dioxide, or twenty-four hours to 5 per cent per volume strength of the same gas. After period of exposure there shall be thorough mechanical cleansing, after which the woodwork and all other exposed surfaces shall be washed with an acid solution of bichloride of mercury, 1 to 1,000, or a 3 per cent solution of pure carbolic acid. Fabrics which can not be removed shall be thoroughly saturated with a solution of bichloride of mercury, 1 to 1,000, or a 3 per cent solution of pure carbolic acid.

(b) After the removal of the bedding, carpets, and furnishings, all apertures being tightly closed, the steerage, cabin, and forecastle of a vessel may be disinfected by formaldehyd gas of not less than 2 per cent per volume strength, the time of exposure to be not less than twelve hours. The gas may be generated from a mixture containing formalin 100 parts, calcium chloride or sodium nitrate 20 parts, and glycerin 10 parts. The gas is evolved from this solution by heating it in a special boiler, autoclave, or formaldehyd generator. One liter of a 40 per cent solution of formaldehyd gas will evolve about 1,425 liters (50.1 cubic feet) of the gas at 20° C. (68° F.), and will be sufficient for 71 cubic meters (2,505.5 cubic feet) of space. After the disinfection of apartments, steerage, cabin, and forecastle by formaldehyd gas, the latter may be neutralized by ammonia gas, evolved from water of ammonia by heat or by evaporation from water of ammonia sprinkled on the floor.

Bedding, fabrics, and carpets must be removed and disinfected in the manner described for personal effects of passengers and crew.

PERSONAL EFFECTS OF PASSENGERS AND CREW.

22. Clothing, bedding, and other articles shall be disinfected by one of the following methods:

(a) For articles not injured by steam by exposure to steam at a temperature of 100° to 102° C. for thirty minutes after such temperature has been reached in a special chamber. Disinfection by steam is not allowed in the hold or forecastle.

(b) By boiling for fifteen minutes, all articles to be submerged.

(c) By thorough saturation in a solution of bichloride of mercury, 1 to 1,000, drying being allowed before washing.

(d) Sulphur fumigation of personal effects, when other methods are unavailable, may be used in a closed compartment, with exposure of twenty-four hours if 5 per cent per volume strength, or twelve hours if 10 per cent per volume is used.

(e) By formaldehyd gas, used in the ordinary jacketed steam disinfecting chamber when the latter is provided with a vacuum apparatus and special apparatus for generating and applying the gas. Following is the method of using formaldehyd gas in the steam chamber :

23. *Use of formaldehyd in steam chamber.*—Raise and maintain the temperature of the chamber at 90° C. by the use of steam in the jacket.

The number of cubic centimeters in the formalin mixture to be used may be found by dividing the capacity of the chamber in liters by 4. For example, a chamber of 2,500 liters capacity would require 625 c.c. of the mixture. The time of exposure should not be less than thirty minutes. Clothing, bedding, etc., thus disinfected should be exposed *in situ* to equal amount of ammonia gas generated by the special apparatus attached to the chamber, using one-half as much water of ammonia as formalin. The quantity of water of ammonia required for neutralization after the above-named methods is one-half liter (0.52 quart) of water of ammonia for each liter (1.04 quarts) of formalin.

24. Cooking and eating utensils should be immersed in boiling water or steam.

FINAL DISPOSITION OF VESSELS.

Before the vessel is allowed to dock, the following precautions must be enforced :

25. After the cargo has been discharged, the vessel must be submitted to a disinfection of all parts simultaneously by sulphur dioxide gas of 5 per cent per volume strength for not less than twenty-four hours in order to insure destruction of all animal life aboard. The remains of all rats and vermin should be gathered and burned, and the place where gathered subsequently disinfected with bichloride solution.

26. Rats must not be handled with bare hands.

27. The vessel must then be kept under observation a sufficient length of time to satisfy the quarantine officer that all are destroyed, and a new crew, or a crew that has passed the period of observation, should be provided.

DETENTION OF PERSONNEL.

28. If practicable, anti-pest serum should be used as a preventive measure on all the personnel of any vessel arriving with a history of sickness of a suspicious character on board during the voyage.

29. The personnel of vessel shall be detained under observation fifteen days from the last possible exposure to infection.

30. The people detained shall be inspected by the physician twice daily, and under his constant surveillance, and no intercourse will be allowed between different groups while in quarantine.

31. No direct communication shall be allowed between any person detained in quarantine and anyone not in quarantine, except through the quarantine officer, or by his order, through his agents.

32. The water and food supply will be strictly guarded to prevent contamination, and issued to each group separately.

33. Food of a simple character sufficient in quantity, thoroughly cooked, shall be issued to those detained in quarantine.

34. Cleanliness of quarters and of persons shall be enjoined and enforced daily. Disinfection shall be used where there is any possibility of infection.

35. Water-closets, urinals, privies, or troughs shall be provided, and their contents disinfected before they are discharged.

36. In any group in which plague appears the sick will be immediately isolated in hospital, and the remaining persons in the group shall be bathed and their effects be disinfected, then removed to other quarters, if possible, and the compartment disinfected.

37. No direct communication shall be allowed between the physician and attendants of the hospital and those detained in quarantine in barracks.

38. No persons shall be discharged from quarantine until fifteen days have elapsed since the last exposure to infection and a final disinfection of such effects as were taken to barracks.

39. No convalescent from plague shall be discharged from quarantine until after a sufficient time has elapsed to insure his freedom from infection.

40. The body of no person dead of plague shall be allowed to pass through quarantine. The body should be cremated, if practicable. If not, it should be wrapped, without preliminary washing, in a sheet saturated with a solution of bichloride of mercury, 1 to 500, and buried, surrounded by caustic lime.

WALTER WYMAN,

Supervising Surgeon-General M. H. S.

Approved:

L. J. GAGE, *Secretary.*

NOTE.—Officers of the Marine-Hospital Service at national quarantine stations state that it is not uncommon on wooden vessels, especially those recently engaged in the grain trade, to gather up, after disinfection of the hold with sulphur, a washtub full of dead rats; generally from alongside the keelson, where they have apparently gone to avoid the fumes of the sulphur, which rise while hot and sink upon cooling.

In using the pot plan of disinfection it is customary to place the pots between decks, or, where there is only one deck, to elevate the pots on piled-up ballast, allowing the fumes while hot to reach the upper part of the hold, and, as they cool, to sink, thus avoiding the checking of the fire in the pot until the maximum amount of sulphur may be burned.

So far as present knowledge goes, the most available method of killing rats in any ship is by sulphur fumes, and this may be done with reasonable certainty if the quantity of sulphur burned and the period of exposure to the gas complies with the present United States quarantine regulations, which, stated briefly, are as follows:

Four and one-half pounds of sulphur burned in an iron pot to each 1,000 cubic feet of space for both wooden and iron vessels, the period of exposure to the fumes to be in the case of wooden vessels, empty, forty-eight hours; iron vessels, empty, twenty-four hours; wooden vessels, with cargo, seventy-two hours; iron vessels, with cargo, twenty-four hours.

Generally speaking, when gas is generated in 10 per cent per volume by a specially devised furnace, one-half the exposure above stated will be sufficient to accomplish the results desired.